DEPARTMENT OF INDUSTRIES

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OFFICE OF THE DIRECTOR OF INDUSTRIES,
New Customs House, Ballard Road,
Bombay, the 8th October 1919.

From

R. D. BELL, Esq., C.I.E., I. C. S.,
Director of Industries,
Bombay;

To

THE CHIEF SECRETARY TO GOVERNMENT,
Revenue Department,
Bombay.

Sir,

I have the honour to submit the annual report of the Department of Industries for the year 1918-19.

2. Mr. P. J. Mead, C.I.E., I. C. S., held charge as Director till 18th April 1919 when I relieved him. In the following month I took charge, in addition, of the appointment of Controller of Munitions, Bombay Circle.

Expenditure.

3. The expenditure on the Department during the financial year 1918-19 was Rs. 73,000.

Staff.

4. There is still no full-time expert staff at the command of the Department which meantime relies for technical assistance and advice on the part-time services of officers of other departments and institutions. In engineering matters the Mechanical Engineer to Government with his staff and Mr. Tom S. Dawson, Principal

of the Victoria Jubilee Technical Institute, have been of great help. Dr. A. N. Meldrum, Professor of Chemistry, Gujarat College, Ahmedabad, and Mr. A. J. Turner, head of the chemistry section of the Victoria Jubilee Technical Institute, have dealt with chemical problems, Mr. E. R. Fern continued to serve as pottery expert, and Mr. T. J. Walke as part-time Superintendent of Fisheries, Southern Range. In addition there are in this and other provinces special departments and technical or research institutions which have been consulted, when necessary, regarding matters on which their members are expert advisers. I have also been fortunate in obtaining useful information and assistance in connection with the vegetable oil industry from Lieutenant A. F. Yuill, Assistant Controller, Oils and Paints. The appointment of a suitable expert staff is the first requirement of the Department, but in the circumstances of the year this has been impracticable.

5. The members of the Advisory Committee appointed to assist me during the year were :—

The Hon'ble Mr. Purushottamdas Thakurdas, C.I.E., M.B.E.

The Hon'ble Mr. Munmohandas Ramji.

C. N. Wadia, Esq., C.I.E.

The Hon'ble Mr. Chunilal V. Mehta, M.A., LL.B.

The Hon'ble Mr. Nigel F. Paton.

A. J. Raymond, Esq.

Rahimtulla Currimbhoy, Esq.

A. T. Arnall, Esq.

M. de P. Webb, Esq., C.I.E., C.B.E. (Karachi).

Policy.

6. In the last report my predecessor aptly described the policy of the new Department, under war conditions, as one of judicious opportunism. Amidst the changes brought by peace new

difficulties have arisen in mapping out definite lines of advance and of obtaining staff when advance seemed justified. The check on the initiative of the Department in this way will be illustrated in later paragraphs. At this stage of development, the activities and policy of the Department are best described, in the first instance, by illustrative examples, and in selecting those given below I have taken, as far as practicable, the chief industries examined by Mr. Mead in the preceding year.

Hand-loom Weaving.

7. There has been no new development in this section of the Department. Mr. Pomfret, the head of the textile section of the Victoria Jubilee Technical Institute, who has hitherto been the chief expert adviser in this industry, proceeded on leave early in 1919 and subsequently retired. The main work of this section is the demonstration of the use of fly-shuttle looms and their introduction amongst the weavers chiefly through the medium of weaving schools. These improved looms are now in use in large numbers in many weaving centres and the success of this line of work, of which the credit is due to the Registrar of Co-operative Societies, though limited, is undoubted. I do not entirely share my predecessor's views that the weaving schools are not the most economic arrangement possible and that they should be run by local bodies with the assistance of grants-in-aid. I have asked for sanction to introduce the method of popularizing fly-shuttle slays through demonstrators who will earn commission on each new slay which they introduce. But I understand that in another province the method of short time demonstrations has shown the defect that at the first difficulty which arises the weaver is strongly inclined to abandon any new mechanical contrivance and revert to his old methods, unless there is someone on the spot to help him. The weaving schools certainly overcome this difficulty and train the younger men in proper methods. In the early stages of a school there are advantages in having a centralized technical control free

from all possible adverse local influences, and at the present time I think that, as a rule, a local body should not be expected to finance and control a school till the latter is well established and, from the departmental point of view, has practically served its purpose. At this stage, the local weaving population are frequently keen that the school should continue its activities, and in such cases the active assistance of local bodies may reasonably be expected.

8. The introduction of improved mechanical appliances is the only profitable line of advance in the hand-loom industry at the present time. Imported healds, reeds, shuttles and pirns are now used in the schools and their advantages over the country-made articles are sufficient to have induced an increasing demand for them by the weaving population.

9. At the beginning of the year there were weaving schools at Dhulia (West Khandesh), Bhiwandi (Thana), Nasirabad (East Khandesh), Sangamner (Ahmednagar), Kamatgi (Bijapur) and Kittur (Belgaum). At Dhulia, where 650 fly-shuttle slays are now in use, the school will be closed as soon as the local authorities have decided whether to open a weaving section in the local technical institute; it is continued meantime so that there may be no break if the technical institute introduces instruction in weaving. At Bhiwandi over 500 fly-shuttle slays are in use but the school is continued in connection with local experiments in warping and sizing. The work of the Sangamner school is good, of Kamatgi fair and of Nasirabad poor but improving. The school at Kittur was closed in December after 80 improved looms had been introduced. There were also demonstrations, extending over six months or more, at three centres which resulted in the successful introduction of single and double fly-shuttle slays. Instruction was also given to the students at the Agricultural School at Devi Hosur. Experiments with a warping and sizing machine and a contrivance for producing solid silk borders were made at Dharwar but with no very definite results. The warping and sizing machine is unsuited to the individual

weaver but may be profitable to small factories employing a number of weavers and the plant will be tried further at Bhiwandi with the object of testing it for this purpose.

10. The dye market has again given trouble during the year to the weavers : a further reference to this subject is made later.

Pottery.

11. Mr. Fern's services continued during the year at the disposal of the Education Department as Superintendent of the pottery section of the Sir J. J. School of Art. It was arranged last year that no new students should be admitted to this section and that the classes should be gradually closed in anticipation of the establishment of a new Demonstration Pottery Factory in Salsette. It was soon evident, however, that to maintain continuity and keep the staff in work till the new factory was complete the pottery section must continue for some time on its original lines, and this has now been arranged.

12. After the complete surveys made last year, the samples received and tested were small in numbers, viz. :—

Clays	..	Received, 9 samples ; tested, 3.
China clay	..	Received and tested, 1 sample.
Fire clay	..	Received, 1 sample.
Sands	..	Received and tested, 3 samples.
Quartz	..	Received and tested, 1 sample.
Others	..	Received, 2 samples ; tested, 1.

13. During the year Mr. Fern resurveyed the red clay resources at Kurla for the new demonstration factory, and visited the Lakhtar State in Kathiawar to select a fire clay for the manufacture of the bricks required for the furnaces in the new factory. These will be prepared at the School of Art by the students under Mr. Fern's superintendence. He also visited the Ahmedabad district and advised a local syndicate regarding the working of its

kaolin deposit. A large deposit of China clay in the south of the Presidency is also under investigation, and arrangements have been made for refining a one-ton sample for test as a sizing material in a local mill. Mr. Fern also inspected the manufacture, for the Irrigation Department, of pipes for land drainage in the districts of Nasik and Poona, and gave advice.

14. The scheme for the Demonstration Pottery Factory has been submitted for sanction, but further progress is barred, at the moment, pending the completion of the scheme for industrial development at Kurla and Kirol in Salsette which is mentioned later. The site of the new factory has required careful consideration, and it has now been decided that it should be located, if possible, on one of the railway sidings in the new industrial area. Its exact position is therefore dependent on the scheme of development finally adopted.

15. Local private enterprise has not made any advances in this industry, and in one instance there has been a set-back. There are several schemes in the air, but the general conditions seem only to have strengthened the case for an experiment in pioneering and demonstration by Government. One mofussil enterprise started on insufficient capital applied for financial assistance which was refused. The whole policy of financial assistance by Government to industries has still to be worked out.

Oil Seed Crushing.

16. The Department has done nothing directly to assist this industry, with the possible exception of despatching a sample of good groundnut cake to the Indian Trade Commissioner in London for obtaining the opinion of an important firm of biscuit manufacturers on the possibility of developing the manufacture of nutramine. Nothing practical has resulted from the information hitherto published by the Department regarding the value of this foodstuff, nor is anything likely to result so long as the available plant in India is unable to reduce the oil content of groundnut cake to the limit

of five per cent prescribed by Mr. Mackenzie Wallis who conducted the investigations and brought his results to public notice. I mention the oil industry because it affords an opportunity of making remarks on the business side of industries generally.

17. There is a singularly large number of individuals who approach the Department for advice apparently on the assumption that the industrial battle begins and ends with the overcoming of technical difficulties in production and who overlook the elementary fact that the profitable disposal of its products is the real aim of and usually the chief obstacle to fresh industrial enterprise. The manufacture of Portland cement from pearls may be a technical probability, but it is outside the realm of business possibilities; yet schemes are gravely suggested in which the chances of profit are hardly more apparent. Even in established industries where the costs of production are known there is a tendency to think that expansion ends with the erection of new factories regardless of the need of new markets for an increased output. In India there is ample crushing power to meet all internal requirements of vegetable oil, and failing new internal demands an expanded oil industry must look for new markets abroad. The controlling factors here are the comparatively small demand in India for oil cake and the fact that a foreign market requiring both the oil and the cake naturally imports the seed and crushes for itself; the economy in containers and railway and ocean freights is obvious. The protectionist may suggest export duties on the seed, but, unless the seed is an Indian monopoly without a substitute, this course means loss to the agriculturist and no likelihood of a larger market for the industrialist.

18. Quite a number of schemes, ranging from petty to important, have been brought before me for advice on various points, and with the assistance of Lieutenant Yuill, which I have already acknowledged, the general position of the industry has been fully discussed with actual or prospective millowners. In only one case of contemplated expansion—the most important—had the need of finding new markets been recognized. The answer to the critics

who stated that the Department must investigate why Indian capital is not attracted to the oil industry and remove the difficulties, is that existing concerns can more than meet existing demands and the real problem is to find new markets. The expansion of the industry virtually depends on the rate at which the Indian agriculturist can use increasing quantities of cake for fodder and manure, and this leads into problems which are the special work of another department. Given a better Indian market for the cake, new outlets would probably arise for the oil, for example, in an expanded soap industry.

19. Whether the efficiency of the industry can be improved is another question. On the large scale a combination of cage presses with an extraction plant seems feasible. For certain seeds the rotary *ghani* is hard to beat, and it is probable that with better mechanical equipment the village oilman can still prosper. In this connection, the possibility of improving the quality of the oil from village presses may be worth investigation. Help to small concerns and consideration for the village industry must await, however, the appointment of a technical staff.

Casein Manufacture.

20. War demands led to an investigation of casein manufacture which was terminated by the resignation of the chemist in charge, Mr. Mackenzie Wallis. It has since been taken up by Dr. A. N. Meldrum with the help of an assistant chemist. An investigation of this kind must necessarily take time. The present position is that a large sample of sulphuric casein prepared by Dr. Meldrum has been sent to the United Kingdom for a report. I am also in correspondence with the Indian Trade Commissioner in London regarding technical and other assistance which may be expected from certain sources. Casein is not a new industry in the Presidency, but it seems capable of technical improvement and expansion, and two or three firms or individuals of standing are interested in its possibilities. As in the case of vegetable oils

market difficulties may ultimately prove more formidable than technical problems. The present market cannot be maintained for ever, and when old sources of supply are fully re-opened the position may be very different. My enquiries show that some time before the war one enterprising Indian studied the industry carefully in England, Europe and America, but the market collapsed for a considerable period, so that no amount of technical skill could, at the time, establish the industry on a paying basis in India. The technical uses of casein are, however, now rapidly increasing and likely to absorb an increased output.

21. Dr. Meldrum is also experimenting on the production of casein from separated milk by the method employed in France of using an electric current. He has also made preliminary experiments in the manufacture of gallalith. Mr. Mackenzie Wallis had begun an investigation of the manufacture of casein cement for aircraft purposes, and though this has not been definitely restarted, it has been found easy to produce glue of good quality. There are now good prospects of locally made casein becoming the basis of further local industrial development.

Chemical and Allied Industries.

22. *Bitterns.*—There are two or three schemes for the establishment of new chemical industries near Bombay regarding which the Department has been consulted on various points. The details are necessarily confidential, but there is no harm, except the risk of being tedious, in repeating the statement that here also the difficulty will be to obtain a profitable market for the products and, in an increasing degree, for the by-products. The chief scheme with which the Department is actively concerned is the utilization of the bitterns at Kharaghoda which Mr. Mead described as the prime subject of investigation last year. The Pioneer Magnesia Company has improved and extended its premises, installed a railway siding and loading platform and is arranging to purchase a motor rail wagon with a tank and pump in order to bring the crude

bitterns from the pans to the factory. An improved process of manufacture was devised by Mr. Mackenzie Wallis and the necessary plant designed by Mr. Dawson. A new agreement with the Company provides that it should make a trial on a large scale of the manufacture of magnesium chloride and magnesium sulphate by the new method. It is hoped that experience will prove that it is advisable to multiply the new plant. The objects of the new process are a greatly improved production of magnesium chloride, economy of fuel and the full recovery of by-products of good quality. The new experimental plant is now ready and will be worked next season. The by-products will be obtained by treating the sludge from the chloride vats with sulphuric acid so as to convert the chloride in the sludge into practically pure magnesium sulphate; the hydrochloric acid set free in this process will be utilized for the production of zinc chloride. Laboratory experiments on this subsidiary process have proved successful, and the Pioneer Magnesia Company is ordering a small manufacturing plant which, if successful, will be replaced by a large plant.

23. The whole experiment, which is under the control of Mr. Turner, has also been arranged with a view to testing the bitterns as a possible source of bromine, and arrangements have been made, through the Indian Munitions Board, for sending next cold weather a complete range of samples of brines, bitterns and crude and refined salts to England for independent analysis.

24. Similar investigations will be instituted regarding the possibilities of manufacturing magnesium salts and extracting bromides at Aden, and when Mr. Turner, who is controlling this investigation also, has completed it, the results will be submitted to the Indian Munitions Board. The investigation has been delayed by difficulties incident to obtaining a full range of samples and by the illness of the assistant chemist under Mr. Turner. The possibility of producing bromine and bromides depends on market conditions to a peculiar degree. The supplies from Germany and America are ample, and prices in the past have fluctuated over a

long range in a manner dependent entirely on whether the manufacturing organizations in Germany and America were competing or selling in agreement. The question of obtaining bromine supplies within the Empire was raised during the war, and the establishment of a bromine and bromide industry within the Empire will probably depend more upon imperial policy than mere industrial and commercial factors.

25. *Sodium carbonate.*—In December 1917 attention was drawn to the possibility of increasing the yield of sodium carbonate from the alkali deposits in Sind and these were finally surveyed in 1918-19 by Mr. G. de P. Cotter of the Geological Survey of India. The deposits are distributed over two areas, the first lying mainly, and the second entirely, in the Khairpur State. In these areas, shallow lakes or *dhands* are formed during the rains, into which are washed soluble salts from the soil and sub-soil, so that eventually they contain concentrated solutions of various salts, of which the principal is carbonate of soda. The water in the lakes concentrates during the dry season and the *chaniho* (carbonate of soda) is collected just before the rains. Only those lakes which are very shallow, usually 1 to 3 feet deep, and which therefore form natural evaporating pans, are worked for *chaniho*, and Mr. Cotter suggested that the amount produced might be considerably increased if the larger *dhands* which are over 3 feet deep were worked by constructing 'soda gardens' near their margins and allowing the solution to concentrate by solar evaporation. He also suggested that the quality of the soda obtained might be much improved by the intelligent use of hydrometers, as it has been shown that the concentration should not be allowed to pass a specific gravity of 1·280. At present the *dhands* are sometimes allowed to dry completely before any *chaniho* is collected, and the mineral is thus contaminated by the presence of the impurer fractions which are deposited after the *chaniho*. These suggestions were communicated to the Commissioner in Sind for the benefit of the Khairpur State and of the areas in Sind itself where the deposits

are worked. The amount of soda annually produced will never be very great. In addition to the portion sold in the bazars of Hyderabad and Karachi for use in washing, dyeing, cookery, etc., a variable quantity is exported. In 1916-17 this amounted to 880 tons, valued at over one lakh of rupees. Even under the best conditions the production is not likely to exceed four or five thousand tons annually, as compared with an average annual import of over 26,000 tons. The results of applying the suggestions made by Mr. Cotter, which are now the subject of correspondence with the authorities in Sind, will be watched next working season.

26. *Salai resin.*—Of other subjects referred to Mr. Turner, mention may be made of the oleo gum resin of *Boswellia serrata* to which a reference was made in last year's report. Laboratory work, which was delayed for want of suitable apparatus, has now begun. A similar investigation is also in progress at the Indian Institute of Science, Bangalore, and it is believed that private enterprise is also investigating. The turpentine produced is of good quality but the resin is not so good and the gum is practically valueless. If an improved gum can be produced the crude resin could probably be exploited with profit.

Fisheries.

27. Some progress has been made towards organizing this section of the Department, of which the main lines were laid down by Mr. Mead. Application has been made for the loan of the services of a marine biologist, with knowledge and experience of the scientific and economic sides of the industry, who will investigate the resources to be exploited and make proposals for the means of doing so and the necessary organization. A composite trawler of the Castle type, which had been constructed in Bombay for purposes connected with the war, has been purchased, and, when the services of a trawling master and mate have been engaged, the fitting of the vessel as a trawler will be made under their direction. This is a field for Government endeavour analogous to the explora-

tion of the country's mineral resources by the Geological Survey of India. In the case of fisheries, however, I consider that mere exploration work should, at the outset, be subordinated to the policy of ascertaining definitely whether trawling will or will not pay in Bombay waters. If it does pay, and perhaps even if it does not pay, there will probably be for many years to come a rich field for scientific and economic enquiry.

28. Mr. Walke, part-time Superintendent of Fisheries, Southern Range, continued his local enquiries till he was transferred to Bombay. At his suggestion, the Collector of Kanara has taken measures for the protection of the natural oyster beds situated at the mouth of the Tadri creek in the Kanara district, and Mr. Walke is carrying out operations to help the beds to recover from the depletion which they had suffered. Next year he will make experiments and demonstrations in the manufacture of fish oil, for which purpose he has been provided with two portable presses. It is unfortunate that unavoidable delay in securing his transfer from the Salt Department has prevented him from beginning full-time work at the opening of the new fishing season.

Glass.

29. The glass factories were heavily handicapped in the earlier part of the year by difficulties in obtaining coal, and at a meeting of their representatives with Mr. Mead, arrangements were made in consultation with the Coal Controller for a minimum supply of coal to keep in working order furnaces which were engaged on orders from Government and public bodies. Nevertheless, some factories had occasionally to close altogether for want of fuel and raw materials. Mr. Dawson gave one factory aid in working useful plant which had been lying idle. Recently the Director of the Geological Survey has accepted proposals for a survey of the sands in the Presidency, suitable for glass manufacture, and this will be made in the cold weather. A conference will also shortly be held with representatives of the

industry to discuss what measures can be adopted for its assistance. Here, again, it is not the difficulty of making glass but the difficulty of meeting foreign competition which has to be overcome, and probably the first step is for the Department to devise a costing system and arrange for its introduction in one or two factories with the object of ascertaining what the economics of the industry really are. Bombay City, where no less than six glass factories are now located, is far from the Indian sources of sand and coal, and has not the protection against foreign competition which is afforded by railway freights to a place like Allahabad which has sand at its door and coal nor far distant.

Sugar.

30. I mention this for two reasons. The Advisory Committee has recommended that the next State technical scholarship should be awarded for the study of sugar technology including sugar chemistry. Secondly, a member of the Belapur Sugar Syndicate has kindly supplied statistics to show that there are good prospects for an industry undertaking the manufacture of a standard *gur* packing case and his suggestions are now under the consideration of the Forest Department.

Tanning.

31. It is most unfortunate that at a time when the tanning industry in other provinces is making preparations for developments on a notable scale, the industry in Bombay should be handicapped by uncertainty regarding its location in the future. Dharavi, where the tanneries are now situated, must be evacuated in connection with improvement and extension schemes in the north of the island of Bombay, and till large schemes now under the consideration of Government mature, the tanners are at a loss what to do.

32. Government have issued orders regarding experiments in the extended cultivation of *tarwad* (*Cassia auriculata*), the bark of which is the staple tanning material in India, and the Forest

Department is testing the cultivation in Sind of *Caesalpinia brevifolia* which has been recommended by the Tanning Adviser to the Indian Munitions Board.

33. During the previous year instructions were issued, at the instance of the Indian Munitions Board, with the object of improving the flaying of skins and hides. There is nothing to show that any improvement actually resulted and the problem, which is one of great difficulty, has again been under examination.

34. I shall now endeavour to sum up many of the scattered activities of the Department under one or two general headings.

Pioneering and Demonstration.

35. These are the methods which chiefly fascinate the popular imagination and it is worthwhile to consider their limitations. In Indian agriculture they are practically the standard methods of progress, but agriculture is sharply differentiated from industries in that it works for the advantage of thousands of small producers and scarcely knows the fear of over-production. When the Agricultural Department has successfully pioneered on its own farms the cultivation of, say, an improved variety of cotton, its demonstrations are attended with little or no risk that the new variety will be sown by too many cultivators or that large sums will be invested in the new cultivation by individuals who have neither the knowledge, experience or natural aptitude for any form of cultivation whatever. In Indian industry the case is different. Except in special cases, it is impossible for the fruits of any successful pioneering effort to be reaped directly by more than a few. The special exceptions include the village industries, of which handloom weaving is typical. Here the Industries Department is working on lines analogous to those of the Agricultural Department, and any improvements which are found suitable for the industry benefit workers by the thousand. The small scale factory for the production of articles in large demand is the next most suitable field for pioneering and demonstration. But the limitations are

obvious. Private enterprise leaves few profitable branches of manufacturing industry unexploited and the idea that a Government Department should successfully pioneer new industries and transfer them when established to private enterprise can only very occasionally be realized. The Department has made arrangements to pioneer in trawling and has submitted a scheme for a similar experiment in pottery and there the pioneering effort rests for the moment. One defect of these experiments, from the business point of view, is that they have usually to be arranged on a scale as small as is compatible with the demonstration of a commercial proposition, whereas the private industrialist naturally plans his venture on as large a scale as his market, his resources and other governing factors will permit.

36. As a supplement to complete pioneering efforts, such as fish trawling and pottery manufacture, work of an experimental nature will be done by the Department to assist the pioneering of new industries without the Department itself actually organizing production on a factory scale. Instances of this line of activity at the present time are the manufacture of magnesium chloride, bromine and bromides, casein and casein derivatives, and the utilization of the gum oleo resin of *Boswellia serrata*. Last year certain button making machinery was taken over and experiments begun with the object of assisting to meet the war demands for buttons, but I have meantime stopped this pseudo-pioneering effort till more information is collected.

37. The idea of demonstration factories is another product of the discussions of recent years but it has not yet in this Presidency been developed except for pottery where demonstration will be combined with pioneering and experiment. It has its origin in the dearth of local experts and in the lack of facilities for the adequate training of young Indians in manufacturing industries. To those who understand the conditions abroad which create the expert and the manager, the idea of reproducing these conditions in a Government demonstration factory will readily

suggest criticisms. The demonstration factory is mentioned here, not for its merits, if it has any, or its defects, which are obvious, but to draw attention to the lack of facilities for the industrial training of young Indians which the public, including the local capitalist, rightly feel must receive attention from Government. As a palliative at least, this Department can arrange to a limited extent to provide the capitalist and the industrialist with the technical advice and aid which is otherwise lacking.

Technical Assistance to Industries.

38. With the staff at its disposal the Department has done what was possible to meet the demand for technical assistance. Mr. Dawson has devised an improved silk twisting machine for the silk industry at Surat. The machine now in use is good of its kind and Mr. Dawson's aim is to produce a standardized model which will give better results than the make-shift varieties now in use. Success is reduced to a matter of costs and these have still to be investigated. Mr. Dawson also gave assistance to a gold and thread factory of which I hope to give the results in a future report, to a factory producing raw hide pickers and to a hosiery factory. Mr. Turner has devised for a brush factory a method of sterilizing bristles. These are instances of assistance which should be multiplied.

39. A plant for the improved distillation by steam of *rosha* grass oil, which was designed by the Forest Economist at Dehra Dun, was completed, delivered and put through a trial working in the jungle by the staff of the Public Works Department Workshop at Dapuri. The trial gave satisfaction to the producers of the oil but owing to short supplies of *rosha* grass consequent on the bad monsoon of 1918 further operations had to be postponed.

Industrial and Commercial Intelligence.

40. Under industrial intelligence I class information enabling enquirers to approach direct the proper authorities or experts. As an instance, enquirers regarding the paper pulp and paper industries are supplied by the Department with information

of purely local import and for the rest are referred to the Consulting Cellulose Expert to the Government of India. Many of these industrial enquiries are, as might be expected, entirely futile, and the Department serves to sift the chaff from the grain; otherwise, to vary the metaphor, it acts as a switchboard to direct the currents of enquiry. Commercial intelligence covers a wide range, and in obtaining it I owe acknowledgments to His Majesty's Trade Commissioner at Calcutta, the Director-General of Commercial Intelligence, Calcutta, the Indian Trade Commissioner, London, and numerous private sources. This is a sphere of Government activity which requires development and better organization, not only for the province but for India as a whole. Indeed, it is incapable of proper organization on purely provincial lines.

General Assistance to Industries.

41. *Sites for Industries.*—A most useful measure for the assistance of industrial enterprise was taken by Mr. Mead in initiating the acquisition and development for factory sites of five hundred acres of land in Salsette. At the moment of writing, the applications received show that the whole area will be taken up. The scheme involves the construction of sidings and roads, the provision of housing accommodation and the introduction of an ample water supply and drainage system. For the preparation and execution of the scheme in detail a special officer will probably be necessary.

42. *Excise and Salt.*—One manufacturer and several users of denatured and rectified alcohol for industrial purposes have made representations against the restrictions under which they operate. The industry in this province works under disadvantages which do not exist in some other provinces or in Indian States and its grievances will be investigated in consultation with the Department of Excise. The manufacture of refined salt is also under discussion.

43. *Dyes.*—The supply of dyes to industries has received considerable attention. Alizarine dyes became available in larger

quantities during the year, but the demand, especially from the village dyers, soon outstripped the increasing supplies. The measures taken by the agents of the British Alizarine Company to ensure that the dyes reached actual users in the mofussil at the Company's selling price were evaded by dealers who at one period were able to obtain more than three times the price charged by the Company. The position was explained to Collectors of districts and new methods of control introduced. The only real remedy is, of course, an adequate increase in supplies to meet all demands and I have been in correspondence with His Majesty's Trade Commissioner with this object in view. More recently the supply of all classes of dyes has been examined and will probably require attention in the current year.

44. *British Industries Fair.*—At the instance of His Majesty's Trade Commissioner and the Indian Munitions Board, arrangements are being made for the representation of Bombay village industries at the British Industries Fair to be held in the Crystal Palace, London, next February. This Fair is restricted to certain classes of goods and the local exhibit is therefore limited to the following classes of articles :—electro plate, silverware, toys, sports goods and fancy goods. This restriction on the scope of the exhibit causes less practical difficulty in collecting articles for exhibition than the fact that the Fair is a Trades Fair and involves arrangements for the execution of orders with reasonable punctuality and in fair accordance with the samples exhibited.

Conclusion.

45. The Department has been in existence for less than two years and the exceptional circumstances of this period have naturally affected its development. If this report appears a fragmentary record, it but reflects the fragmentary character of the work up-to-date. It is impossible to mention all the odds and ends of work. I have merely endeavoured to illustrate by example the nature of the Department's activities and to indicate the lines on

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which development is proceeding, viz., special sections for fisheries, industrial engineering, industrial chemistry and commercial intelligence with a side show in pottery. There are other matters, notably technical and industrial education, in which the sphere of the Department has barely been yet considered. Till the reform scheme is settled and till decisions are reached on the recommendations of the Industrial Commission, the next step in some direction is sometimes difficult to decide. I do not submit this consideration as an excuse for any failure to meet reasonable expectations of the Department's usefulness. There has been plenty of work to hand and it is a constant difficulty to keep clear of a mass of details in order to organize the Department as an efficient aid to industries.

46. The first charge on the Department must always be assistance to private enterprise and, judging from the increase in personal interviews and the standing of the enquirers, in this respect the recognition of its usefulness is growing. The results are frequently negative and those which are positive are not easily focussed in a report. I look forward to increasing association with private enterprise. Not only should the Department be developed on lines to assist, so far as Government action can assist, private enterprise, but unofficial aid should, *pari passu*, become available for the assistance and development of the Department. I gratefully acknowledge the assistance given by the members of the Advisory Committee, collectively and individually, and only regret that there were not more occasions and more important business to justify calls on their services.

I have the honour to be,

Sir,

Your most obedient servant,

R. D. BELL,

Director of Industries.

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